In the Claims:

Please amend the claims as follows.

1. (Currently Amended) A gas distribution plate assembly for a plasma processing chamber, comprising:

a diffuser plate having an upstream side and a downstream side; and

a plurality of gas passages passing between the upstream and downstream sides, wherein at least one of the gas passages has a ~~right~~ cylindrical shape for a portion of its length extending from the upstream side and a coaxial conical shape for the remaining length of the diffuser plate, the upstream end of the conical portion having substantially the same diameter as the ~~right~~ cylindrical portion and the downstream end of the conical portion having a larger diameter.

2. (Currently Amended) The gas distribution plate of claim 1, wherein the diameter of the ~~right~~ cylindrical shape is between about 0.030 inch to about 0.070 inch.

3. (Original) The gas distribution plate of claim 1, wherein the diameter of the downstream end of the conical portion is between about 0.2 inch to about 0.4 inch.

4. (Original) The gas distribution plate of claim 3, wherein the conical shape is flared at about 20 degrees to about 35 degrees.

5. (Currently Amended) The gas distribution plate of claim 1, wherein the ratio of length of the ~~right~~ cylindrical shape to length of the conical shape is between about 0.8 to about 2.0.

6. (Original) The gas distribution plate of claim 1, wherein a spacing between the downstream end of the conical portion of adjacent gas passages is at most about 0.5 inch.

7. (Original) The gas distribution plate of claim 1, wherein the thickness of the diffuser plate is between about 0.8 inch to about 1.6 inch.

8. (Original) The gas distribution plate of claim 1, wherein the diffuser plate is polygonal.

9. (Currently Amended) The gas distribution plate of claim 1, wherein the ~~right~~ cylindrical shape formed through the diffuser plate have a flow restricting attribute different than the coaxial flared shape.

10. (Original) The polygonal gas distribution plate of claim 8, wherein the diffuser plate is rectangular.

11. (Original) The rectangular distribution plate of claim 10, wherein the gas diffuser plate size is at least 1080 $inch^2$.

12. (Currently Amended) A gas distribution plate assembly for a plasma processing chamber, comprising:

a diffuser plate having an upstream side and a downstream side in the plasma process chamber that is coupled to a remote plasma source and the remote plasma source is coupled to a fluorine source; and

a plurality of gas passages passing between the upstream and downstream sides, wherein at least one of the gas passages has a ~~right~~ cylindrical shape for a portion of its length extending from the upstream side and a coaxial conical shape for the remaining length of the diffuser plate, the upstream end of the conical portion having substantially the same diameter as the ~~right~~ cylindrical portion and the downstream end of the conical portion having a larger diameter.

13. (Currently Amended) The gas distribution plate of claim 12, wherein the diameter of the ~~right~~ cylindrical shape is between about 0.030 inch to about 0.070 inch.

14. (Original) The gas distribution plate of claim 12, wherein the diameter of the downstream end of the conical portion is between about 0.2 inch to about 0.4 inch.

15. (Original) The gas distribution plate of claim 14, wherein the conical shape is flared at about 20 degrees to about 35 degrees.

16. (Currently Amended) The gas distribution plate of claim 12, wherein the ratio of length of the ~~right~~ cylindrical shape to length of the conical shape is between about 0.8 to about 2.0.

17. (Original) The gas distribution plate of claim 12, wherein a spacing between the downstream end of the conical portion of adjacent gas passages is at most about 0.5 inch.

18. (Original) The gas distribution plate of claim 12, wherein the thickness of the diffuser plate is between about 0.8 inch to about 1.6 inch.

19. (Original) The gas distribution plate of claim 12, wherein the diffuser plate is polygonal.

20. (Currently Amended) The gas distribution plate of claim 12, wherein the ~~right~~ cylindrical shape formed through the diffuser plate have a flow restricting attribute different than the coaxial flared shape.

21. (Original) The polygonal gas distribution plate of claim 19, wherein the diffuser plate is rectangular.

22. (Original) The rectangular distribution plate of claim 21, wherein the gas diffuser plate size is at least 1080 $inch^2$.

23. (Currently Amended) A gas distribution plate assembly for a plasma processing chamber, comprising:

a diffuser plate having an upstream side and a downstream side; and

a plurality of gas passages passing between the upstream and downstream sides, wherein at least one of the gas passages has a first ~~right~~ cylindrical shape for a portion of its length extending from the upstream side, a second coaxial ~~right~~ cylindrical shape with a smaller diameter connected to the first cylindrical shape, a coaxial conical shape connected to the second cylindrical shape for the remaining length of the diffuser plate, with the upstream end of the conical portion having substantially the same diameter as the second ~~right~~ cylindrical shape and the downstream end of the conical portion having a larger diameter.

24. (Currently Amended) The gas distribution plate of claim 23, wherein the diameter of the first ~~right~~ cylindrical shape is between about 0.06 inch to about 0.3 inch.

25.. (Currently Amended) The gas distribution plate of claim 23, wherein the diameter of the second ~~right~~ cylindrical shape is between about 0.030 inch to about 0.070 inch.

26. (Currently Amended) The gas distribution plate of claim 23, wherein the ratio of the length of the first ~~right~~ cylindrical shape to the length of the second ~~right~~ cylindrical shape is between about 0.3 to about 1.5.

27. (Original) The gas distribution plate of claim 23, wherein the diameter of the downstream end of the conical portion is between about 0.2 inch to about 0.4 inch.

28. (Original) The gas distribution plate of claim 27, wherein the conical shape is flared at about 20 degrees to about 35 degrees.

29. (Currently Amended) The gas distribution plate of claim 23, wherein the ratio of length of the second ~~right~~ cylindrical shape to length of the conical shape is between about 0.8 to about 2.0.

30. (Original) The gas distribution plate of claim 23, wherein a spacing between the downstream end of the conical portion of adjacent gas passages is at most about 0.5 inch.

31. (Original) The gas distribution plate of claim 23, wherein the thickness of the diffuser plate is between about 1.0 inch to about 2.2 inch.

32. (Original) The gas distribution plate of claim 23, wherein the diffuser plate is polygonal.

33. (Currently Amended) The gas distribution plate of claim 23, wherein the ~~right~~ cylindrical shape formed through the diffuser plate have a flow restricting attribute different than the coaxial flared shape.

34. (Original) The polygonal gas distribution plate of claim 32, wherein the diffuser plate is rectangular.

35. (Original) The rectangular distribution plate of claim 34, wherein the gas diffuser plate size is at least 1080 $inch^2$.

36. (Currently Amended) A gas distribution plate assembly for a plasma processing chamber, comprising:

a diffuser plate having an upstream side and a downstream side in the plasma process chamber that is coupled to a remote plasma source and the remote plasma source is coupled to a fluorine source; and

a plurality of gas passages passing between the upstream and downstream sides, wherein at least one of the gas passages has a first ~~right~~ cylindrical shape for a portion of its length extending from the upstream side, a second coaxial ~~right~~ cylindrical shape with a smaller diameter connected to the first cylindrical shape, a coaxial conical shape connected to the second cylindrical shape for the remaining length of the diffuser

plate, with the upstream end of the conical portion having substantially the same diameter as the second ~~right~~ cylindrical shape and the downstream end of the conical portion having a larger diameter.

37. (Currently Amended) The gas distribution plate of claim 36, wherein the diameter of the first ~~right~~ cylindrical shape is between about 0.06 inch to about 0.3 inch.

38. (Currently Amended) The gas distribution plate of claim 36, wherein the diameter of the second ~~right~~ cylindrical shape is between about 0.030 inch to about 0.070 inch.

39. (Currently Amended) The gas distribution plate of claim 36, wherein the ratio of the length of the first right cylindrical shape to the length of the second ~~right~~ cylindrical shape is between about 0.3 to about 1.5.

40. (Original) The gas distribution plate of claim 36, wherein the diameter of the downstream end of the conical portion is between about 0.2 inch to about 0.4 inch.

41. (Original) The gas distribution plate of claim 36, wherein the conical shape is flared at about 20 degrees to about 35 degrees.

42. (Currently Amended) The gas distribution plate of claim 36, wherein the ratio of length of the second ~~right~~ cylindrical shape to length of the conical shape is between about 0.8 to about 2.0.

43. (Original) The gas distribution plate of claim 36, wherein a spacing between the downstream end of the conical portion of adjacent gas passages is at most about 0.5 inch.

44. (Original) The gas distribution plate of claim 36, wherein the thickness of the diffuser plate is between about 1.0 inch to about 2.2 inch.

45. (Original) The gas distribution plate of claim 36, wherein the diffuser plate is polygonal.

46. (Currently Amended) The gas distribution plate of claim 36, wherein the ~~right~~ cylindrical shape formed through the diffuser plate have a flow restricting attribute different than the coaxial flared shape.

47. (Original) The polygonal gas distribution plate of claim 45, wherein the diffuser plate is rectangular.

48. (Original) The rectangular distribution plate of claim 47, wherein the gas diffuser plate size is at least 1080 $inch^2$.

49. (Currently Amended) A method of depositing a thin film on a substrate, comprising:

placing a substrate in a process chamber with a diffuser plate having an upstream side and a downstream side, and a plurality of gas passages passing between the upstream and downstream sides, wherein at least one of the gas passages has a ~~right~~ cylindrical shape for a portion of its length extending from the upstream side and a coaxial conical shape for the remaining length of the diffuser plate, the upstream end of the conical portion having substantially the same diameter as the ~~right~~ cylindrical portion and the downstream end of the conical portion having a larger diameter; and

depositing a thin film on the substrate in the process chamber.

50. (Original) The method of claim 49, wherein the process chamber is coupled to a remote plasma source and the remote plasma source is coupled to a fluorine source.

51. (Original) The method of claim 50, wherein the diffuser plate is rectangular.

52. (Original) The method of claim 51, wherein the process chamber is a plasma enhanced chemical vapor deposition chamber.

53. (Original) The method of claim 51, wherein the thin film is deposited on the substrate to create flat panel displays.

54. (Currently Amended) The method of claim 51, wherein the thin film deposition rate and uniformity can be modified by adjusting the diameter of the ~~right~~ cylindrical shape.

55. (Original) The method of claim 51, wherein the thin film can be silicon dioxide (SiO_2), silicon oxynitride (SiON), silicon nitride (SiN), amorphous silicon (α-Si) or doped amorphous silicon (doped α-Si).

56. (Original) The method of claim 51, wherein the thin film has cleaning-residue contaminant, such as fluorine, concentration less than $1*10^{20}$ atom/cc.

57. (Original) The method of claim 51, wherein the cleaning-residue contaminant, such as fluorine, concentration can be modified by adjusting the diameter of the right cylindrical shape and the flared angle of the conical shape to be less than $1*10^{20}$ atom/cc.

58. (Currently Amended) A method of depositing a thin film on a substrate, comprising:

placing a substrate in a process chamber with a diffuser plate having an upstream side and a downstream side, and a plurality of gas passages passing between the upstream and downstream sides, wherein at least one of the gas passages has a first ~~right~~ cylindrical shape for a portion of its length extending from the upstream side, a second coaxial ~~right~~ cylindrical shape with a smaller diameter connected to the first cylindrical shape, a coaxial conical shape connected to the second cylindrical shape for the remaining length of the diffuser plate, with the

upstream end of the conical portion having substantially the same diameter as the second ~~right~~ cylindrical shape and the downstream end of the conical portion having a larger diameter; and

depositing a thin film on the substrate in the process chamber.

59. (Original) The method of claim 58, wherein the process chamber is coupled to a silicon source, a remote plasma source and the remote plasma source is coupled to a fluorine source.

60. (Original) The method of claim 59, wherein the diffuser plate is rectangular.

61. (Original) The method of claim 60, wherein the process chamber is a plasma enhanced chemical vapor deposition chamber.

62. (Original) The method of claim 60, wherein the thin film is deposited on the substrate to create flat panel displays.

63. (Currently Amended) The method of claim 60, wherein the thin film deposition rate and uniformity can be modified by adjusting the diameter of the ~~right~~ cylindrical shape.

64. (Original) The method of claim 60, wherein the thin film can be silicon dioxide (SiO_2), silicon oxynitride (SiON), silicon nitride (SiN), amorphous silicon (α -Si) or doped amorphous silicon (doped α -Si).

65. (Original) The method of claim 60, wherein the thin film has cleaning-residue contaminant, such as fluorine, concentration less than $1*10^{20}$ atom/cc.

66. (Currently Amended) The method of claim 60, wherein the cleaning-residue contaminant, such as fluorine, concentration can be modified by adjusting the diameter

of the ~~right~~ cylindrical shape and the flared angle of the conical shape to be less than $1*10^{20}$ atom/cc.

67. (Currently Amended) A method of cleaning a process chamber, comprising:

placing a substrate in a process chamber, which is coupled to a remote plasma source and the remote plasma source is coupled to a fluorine source, with a diffuser plate having an upstream side and a downstream side, and a plurality of gas passages passing between the upstream and downstream sides, wherein at least one of the gas passages has a ~~right~~ cylindrical shape for a portion of its length extending from the upstream side and a coaxial conical shape for the remaining length of the diffuser plate, the upstream end of the conical portion having substantially the same diameter as the ~~right~~ cylindrical portion and the downstream end of the conical portion having a larger diameter;

depositing a thin film on the substrate in the process chamber;

determining if the number of processed substrates has reached a pre-determined cleaning limit;

repeating the steps of placing a substrate in the process chamber, depositing a thin film on the substrate and determining if the number of processed substrates has reached the pre-determined cleaning limit until the number of process substrates has reached the pre-determined cleaning limit, if the number of processed substrates has not reached the pre-determined cleaning limit; and

cleaning the process chamber if the number of processed substrates has reached the pre-determined cleaning limit.

68. (Original) The method of claim 67, wherein the diffuser plate is rectangular.

69. (Original) The method of claim 67, wherein the process chamber is a plasma enhanced chemical vapor deposition chamber.

70. (Original) The method of claim 67, wherein the thin film deposited can be silicon dioxide (SiO_2), silicon oxynitride (SiON), silicon nitride (SiN), amorphous silicon (α -Si) or doped amorphous silicon (doped α -Si).

71. (Original) The method of claim 67, wherein the cleaning is performed by a remote plasma source cleaning process with inert gas flowing at between about 0 slm to about 6 slm, fluorine containing gas flowing at between 1 slm to about 6 slm and the pressure of the remote plasma source generator is maintained at between 0.5 Torr to 20 Torr.

72. (Original) The method of claim 71, wherein the inert gas is Argon and the fluorine containing gas is NF_3.

73. (Currently Amended) The method of claim 67, wherein the cleaning rate can be modified by adjusting the diameter of the ~~right~~ cylindrical shape.

74. (Currently Amended) A method of cleaning a process chamber, comprising:

placing a substrate in a process chamber, which is coupled to a remote plasma source and the remote plasma source is coupled to a fluorine source, with a diffuser plate having an upstream side and a downstream side, and a plurality of gas passages passing between the upstream and downstream sides, wherein at least one of the gas passages has a first ~~right~~ cylindrical shape for a portion of its length extending from the upstream side, a second coaxial ~~right~~ cylindrical shape with a smaller diameter connected to the first cylindrical shape, a coaxial conical shape connected to the second cylindrical shape for the remaining length of the diffuser plate, with the upstream end of the conical portion having substantially the same diameter as the second ~~right~~ cylindrical shape and the downstream end of the conical portion having a larger diameter;

depositing a thin film on the substrate in the process chamber;

determining if the number of processed substrates has reached a pre-determined cleaning limit;

repeating the steps of placing a substrate in the process chamber, depositing a thin film on the substrate and determining if the number of processed substrates has reached the pre-determined cleaning limit until the number of process substrates has reached the pre-determined cleaning limit, if the number of processed substrates has not reached the pre-determined cleaning limit; and

cleaning the process chamber if the number of processed substrates has reached the pre-determined cleaning limit.

75. (Original) The method of claim 74, wherein the diffuser plate is rectangular.

76. (Original) The method of claim 74, wherein the process chamber is a plasma enhanced chemical vapor deposition chamber.

77. (Original) The method of claim 74, wherein the thin film deposited can be silicon dioxide (SiO_2), silicon oxynitride (SiON), silicon nitride (SiN), amorphous silicon (α -Si) or doped amorphous silicon (doped α - Si).

78. (Original) The method of claim 74, wherein the cleaning is performed by a remote plasma source cleaning process with inert gas flowing at between about 0 slm to about 6 slm, fluorine containing gas flowing at between 1 slm to about 6 slm and the pressure of the remote plasma source generator is maintained at between 0.5 Torr to 20 Torr.

79. (Original) The method of claim 78, wherein the inert gas is Argon and the fluorine containing gas is NF_3.

80. (Original) The method of claim 74, wherein the cleaning rate can be modified by adjusting the diameter of the right cylindrical shape.